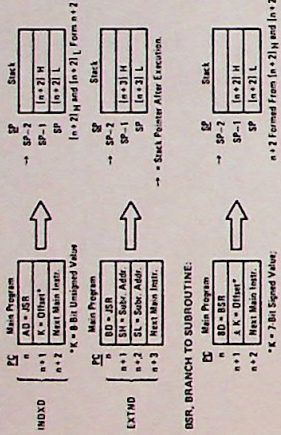
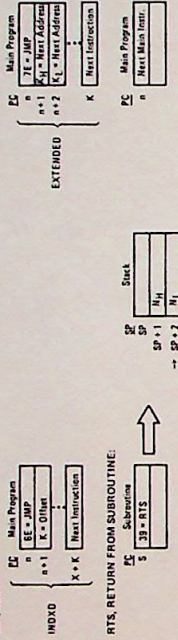


SPECIAL OPERATIONS
15th JUMP TO SUBROUTINE

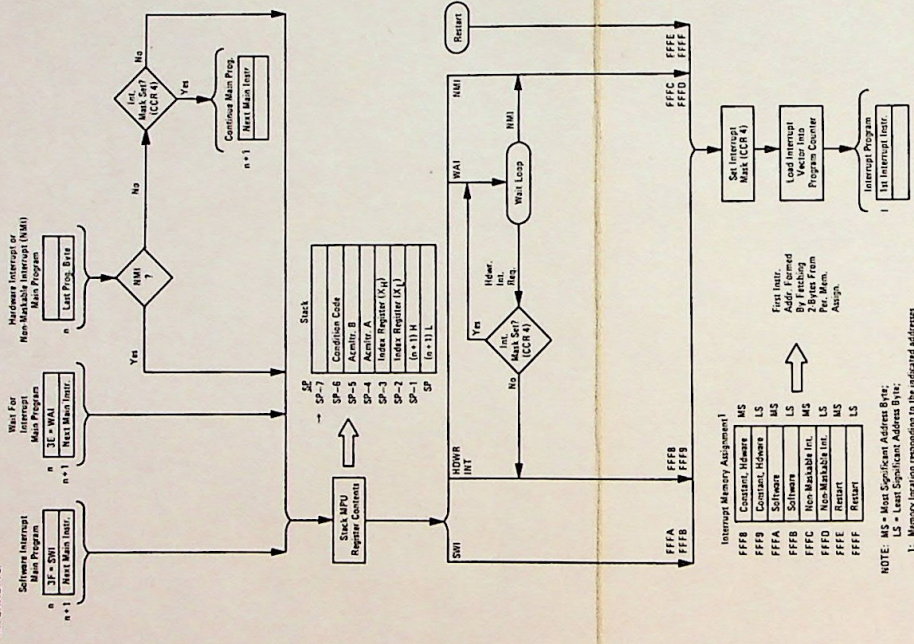
JSR, JUMP TO SUBROUTINE:



JMP, JUMP:



INTERAPTS:



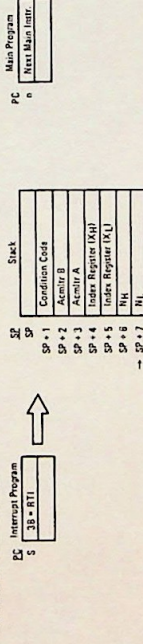
NOTE: MS = Most Significant Address Byte;

US - LEAST SIGNIFICANT ADDRESS BYTE

1: **Methodological Response** (to the methodological arguments)
should be reserved for interval version

FROM THE EDITOR

RTI, RETURN FROM INTERRUPT:



HEXADECIMAL AND DECIMAL CONVERSION

HOW TO USE THE TABLES

CONVERSION TO DECIMAL: Find the decimal weights for corresponding hexadecimal characters beginning with the least significant character. The sum of the decimal weight is the decimal value of the hexadecimal number.

CONVERSION TO HEXADECIMAL: Find the highest decimal value in the table which is lower than or equal to the decimal number to be converted. The corresponding hexadecimal character is the next significant character. Subtract the decimal value found from the decimal number to be converted. With the difference, repeat the process to find subsequent hexadecimal characters.

HEXADECIMAL AND DECIMAL CONVERTOR											
15		14		13		12		11		10	
HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC
0	0	1	1	2	2	3	3	4	4	5	5
6	6	7	7	8	8	9	9	A	A	B	B
C	C	D	D	E	E	F	F	10	10	11	11
12	18	13	19	14	20	15	21	16	22	17	23
18	24	19	25	1A	26	1B	27	1C	28	1D	29
1E	30	1F	31	20	32	21	33	22	34	23	35
24	36	25	37	26	38	27	39	28	40	29	41
2A	42	2B	43	2C	44	2D	45	2E	46	2F	47
30	48	31	49	32	50	33	51	34	52	35	53
36	54	37	55	38	56	39	57	3A	58	3B	59
3C	60	3D	61	3E	62	3F	63	40	64	41	65
42	66	43	67	44	68	45	69	46	70	47	71
48	72	49	73	4A	74	4B	75	4C	76	4D	77
4E	78	4F	79	50	80	51	81	52	82	53	83
54	84	55	85	56	86	57	87	58	88	59	89
5A	90	5B	91	5C	92	5D	93	5E	94	5F	95
60	96	61	97	62	98	63	99	64	100	65	101
66	102	67	103	68	104	69	105	6A	106	6B	107
6C	108	6D	109	6E	110	6F	111	70	112	71	113
72	114	73	115	74	116	75	117	76	118	77	119
78	120	79	121	7A	122	7B	123	7C	124	7D	125
7E	126	7F	127	80	128	81	129	82	130	83	131
84	132	85	133	86	134	87	135	88	136	89	137
8A	138	8B	139	8C	140	8D	141	8E	142	8F	143
90	144	91	145	92	146	93	147	94	148	95	149
96	150	97	151	98	152	99	153	9A	154	9B	155
9C	156	9D	157	9E	158	9F	159	9A	160	9B	161
9E	162	9F	163	A0	164	A1	165	A2	166	A3	167
A4	168	A5	169	A6	170	A7	171	A8	172	A9	173
AA	174	AB	175	AC	176	AD	177	AE	178	AF	179
B0	180	B1	181	B2	182	B3	183	B4	184	B5	185
B6	186	B7	187	B8	188	B9	189	BA	190	BB	191
BC	192	BD	193	BE	194	BF	195	C0	196	C1	197
C2	198	C3	199	C4	200	C5	201	C6	202	C7	203
C8	204	C9	205	CA	206	CB	207	CC	208	CD	209
CE	210	CF	211	D0	212	D1	213	D2	214	D3	215
D4	216	D5	217	D6	218	D7	219	D8	220	D9	221
DA	222	DB	223	DC	224						
DE	226	DF	227	E0	228	E1	229	E2	230	E3	231
E4	232	E5	233	E6	234	E7	235	E8	236	E9	237
EA	238	EB	239	EC	240	ED	241	EE	242	EF	243
F0	244	F1	245	F2	246	F3	247	F4	248	F5	249
F6	250	F7	251	F8	252	F9	253	FA	254	FB	255

POWERS OF TWO	
2^{nd}	7^{th}
1	0
2	1
4	2
8	3
16	4
32	5
64	6
128	7
256	8
512	9
1,024	10
2,048	11
4,096	12
8,192	13
16,384	14
32,768	15
65,536	16
131,072	17
262,144	18
524,288	19
1,048,576	20

ASCII CHARACTER SET (7 BIT CODE)									
HEX CHAR	1	2	3	4	5	6	7		
LS CHAR	000	001	010	011	100	101	110	111	
0 0000	NUL	DLE	SP	0	0	P	\	p	
1 0001	SOH	DC1	1	1	A	Q	a	q	
2 0010	STX	DC2	2	2	B	R	b	r	
3 0011	ETX	DC3	#	3	C	S	c	s	
4 0100	EOT	DC4	\$	4	D	T	d	t	
5 0101	ENQ	NAK	%	5	E	U	e	u	
6 0110	ACK	SYN	&	6	F	V	f	v	
7 0111	BEL	ETB	^	7	G	W	g	w	
8 1000	BS	CAN	~	8	H	X	h	x	
9 1001	EM	J	9	9	I	Y	i	y	
A 1010	LF	SUB	*	A	J	Z	j	z	
B 1011	VT	ESC	+	B	K	[k	[
C 1100	FF	FS	<	C	L	\	l	l	
D 1101	CR	GS	=	D	M]	m	m	
E 1110	SO	RS	>	E	N	^	n	n	
F 1111	SI	VS	/	F	O	_	o	o	

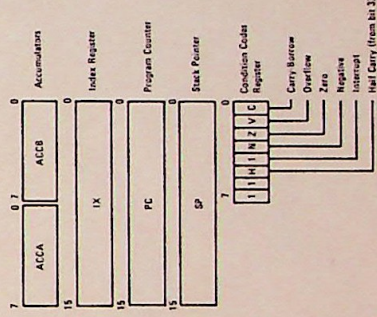
M6800 MICROPROCESSOR

Instruction Set Summary



MOTOROLA

MICROCOMPUTER APPLICATIONS ENGINEERING



Programming Model Of The Microprocessing Unit

COND. CODE REG.														
ADDRESSING MODES														
BOOLEAN/ARITHMETIC OPERATION														
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[illegible]

CONDITIONS CODE REGISTER			CONDITION CODE REGISTER NOTES:									
OPERATIONS	Mnemonic	INHER	BOOLEAN OPERATION									
			OP	~	#	0	1	2	3	4	5	6
Clear Carry	CLC	OC	2	1	0 ← C	•	•	•	•	•	•	•
Clear Interrupt Mask	CLI	OE	2	1	0 → I	•	•	•	•	•	•	•
Clear Overflow	CLV	OA	2	1	0 → V	•	•	•	•	•	•	•
Set Carry	SEC	OD	2	1	1 ← C	•	•	•	•	•	•	•
Set Interrupt Mask	SEI	OF	2	1	1 → I	•	•	•	•	•	•	•
Set Overflow	SEV	OB	2	1	1 → V	•	•	•	•	•	•	•
Arithmetic A → CCR	TAP	OG	2	1	A → CCR	•	•	•	•	•	•	•
CCR → Arithmetic A	TFA	OT	2	1	CCR → A	•	•	•	•	•	•	•

LEGEND:		00	Byte = Zero;
OP	Operation Code (Hexadecimal);	H	Half carry from bit 3;
~	Number of MPU Cycles;	I	Interrupt mask
#	Number of Program Bytes;	N	Negative (sign bit)
+	Arithmetic Plus;	Z	Zero (zero)
-	Arithmetic Minus;	V	Overflow, 2's complement
•	Boolean AND;	C	Carry from bit 1
Mem	Contents of memory location pointed to by Stack Pointer;	R	Reset Always
+	Boolean Inclusive OR;	S	Set Always
•	Boolean Exclusive OR;	!	Test and set if true, cleared otherwise
u	Complement of M;	•	Not Affected
→	Transfer Into;	CCR	Condition Code Register
0	Bit = Zero;	LS	Least Significant
		MS	Most Significant

OPERATION CODE, NUMERICAL LISTING:

OP	MNEM	MODE	~ #	OP	MNEM	MODE	~ #	OP	MNEM	MODE	~ #	OP	MNEM	MODE	~ #										
01	INH	2	1	60	NEG	INXDO	7	2	8C	CPX	IMMED	3	69	SUBA	EXTNO	4	3	D7	STAO	DIR	4	3	2		
02	TAP	2	1	61	COM		7	2	8D	BSR	REL	2	7	81	CMPA		4	3	D8	EOB		4	3	2	
03	TPA	2	1	62	LSR		7	2	8E	BOS	IMMED	3	2	82	SBCA		4	3	D9	AOCC	3	2	2		
04	INH	2	1	63	ROR		7	2	90	SUBA	DIR	3	2	84	ANDA		4	3	DA	ORAB	3	2	2		
05	DEX	4	1	64	ASR		7	2	91	CPA			3	85	BTA		4	3	D8	AODB	3	2	2		
06	CLV	4	1	65	ASL		7	2	97	SCA	3	2	86	LDAA		4	3	DE	LOX		4	3	2		
07	CLV	4	1	66	ROL		7	2	94	ANDA	3	2	87	STAA		5	3	DT	STX	DIR	5	2	2		
08	CLV	4	1	67	DEC		7	2	95	BTA	3	2	88	EOBA		4	3	E0	SUBB	INXDO	5	2	2		
09	CLV	4	1	68	INC		7	2	96	LOAA	3	2	89	AGCA		4	3	E1	CMPB		4	3	2		
10	CLV	4	1	69	TEST		7	2	97	STAA	4	2	8A	ORAA		4	3	E2	SECB		5	2	2		
11	CLV	4	1	70	JMP		4	2	98	EOHA	3	2	8B	ADDA		4	3	E4	AOCC		5	2	2		
12	CLV	4	1	71	CLR	INXDO	6	3	99	ADCA	3	2	8C	CPX		5	3	E5	BTS		5	2	2		
13	CLV	4	1	72	COM	EXTNO	6	3	9A	ORAA	3	2	8D	JSR		9	3	E6	LOAB		5	2	2		
14	CLV	4	1	73	COM		6	3	9B	ADDA	3	2	8E	LOS		5	3	E7	STAB	6	2	2	2		
15	CLV	4	1	74	LSR		6	3	9C	CPX	4	2	8F	STS	EXTNO	6	3	E8	EOBB	5	2	2	2		
16	CLV	4	1	75	ROR		6	3	9D	LOS	5	2	90	SUBB	IMMED	2	2	E9	AOCC		5	2	2		
17	CLV	4	1	76	ROR		6	3	9E	STS	DIR	5	2	C1	CMPB	IMMED	2	2	EA	ORAB		5	2	2	
18	CLV	4	1	77	ASR		6	3	A0	SUBA	INXDO	5	2	C2	SECO	IMMED	2	2	EB	AODB		5	2	2	
19	CLV	4	1	78	ASL		6	3	A1	SCA			5	2	C4	ANDB	IMMED	2	2	EE	LOX		6	2	2
20	BRA	REL	4	2	79	RSL		6	A2	SBCA	5	2	C5	BITS		2	2	EF	STX	INXDO	7	2	2		
21	BRA	REL	4	2	80	DEC		6	A3	ADCA	5	2	C6	LOAB		2	2	F0	SUBB	EXTNO	4	3	2		
22	BRA	REL	4	2	81	INC		6	A4	ANDA	5	2	C8	EOBB		2	2	F1	CMPB		4	3	2		
23	BRA	REL	4	2	82	TEST		6	A5	BTA	5	2	C8	ADCB		2	2	F2	SBCB		4	3	2		
24	BRA	REL	4	2	83	CLR		6	A6	LOAA	5	2	C9	AOCC		2	2	F2	SECB		4	3	2		
25	BRA	REL	4	2	84	ROR		6	A7	STAA	5	2	C9	ORAB		2	2	F4	ANDB		4	3	2		
26	BRA	REL	4	2	85	ASR		6	A8	EOBA	5	2	C9	AODB		2	2	F5	BITS		4	3	2		
27	BRA	REL	4	2	86	ASL		6	A9	ADCA	5	2	CE	LOX	IMMED	3	3	F6	LOAB		4	3	2		
28	BRA	REL	4	2	87	RSL		6	AA	ORAA	5	2	CE	SUBB	DIR	3	2	F7	STAO		5	3	2		
29	BRA	REL	4	2	88	DEC		6	AB	ADCA	5	2	D1	CMPB		3	2	F8	EOBB		4	3	2		
30	BRA	REL	4	2	89	INC		6	AC	ADCB	6	2	D2	SBCB		3	2	F9	AOCC		4	3	2		
31	BRA	REL	4	2	90	TEST		6	AD	ASR	8	2	D4	ANDB		3	2	FA	ORAB		4	3	2		
32	BRA	REL	4	2	91	CLR		6	AE	LOS	6	2	D5	BITS		3	2	FB	AODB		4	3	2		
33	BRA	REL	4	2	92	ROR		6	AF	STS	INXDO	7	2	D6	LOAB	DIR	3	2	FE	LOX		5	3	2	
34	BRA	REL	4	2	93	ASR		6										FF	STX	EXTNO	6	3	2		
35	BRA	REL	4	2	94	ASL		6																	
36	BRA	REL	4	2	95	RSL		6																	
37	BRA	REL	4	2	96	DEC		6																	
38	BRA	REL	4	2	97	INC		6																	
39	BRA	REL	4	2	98	TEST		6																	
40	BRA	REL	4	2	99	CLR		6																	
41	BRA	REL	4	2	100	COM		6																	
42	BRA	REL	4	2	101	LSR		6																	
43	BRA	REL	4	2	102	ROR		6																	
44	BRA	REL	4	2	103	ASR		6																	
45	BRA	REL	4	2	104	ASL		6																	
46	BRA	REL	4	2	105	RSL		6																	
47	BRA	REL	4	2	106	DEC		6																	
48	BRA	REL	4	2	107	INC		6																	
49	BRA	REL	4	2	108	TEST		6																	
50	BRA	REL	4	2	109	CLR		6																	
51	BRA	REL	4	2	110	COM		6																	
52	BRA	REL	4	2	111	LSR		6																	
53	BRA	REL	4	2	112	ROR		6																	
54	BRA	REL	4	2	113	ASR		6																	
55	BRA	REL	4	2	114	ASL		6																	
56	BRA	REL	4	2	115	RSL		6																	
57	BRA	REL	4	2	116	DEC		6																	
58	BRA	REL	4	2	117	INC		6																	
59	BRA	REL	4	2	118	TEST		6																	
60	BRA	REL	4	2	119	CLR		6																	
61	BRA	REL	4	2	120	COM		6																	
62	BRA	REL	4	2	121	LSR		6																	
63	BRA	REL	4	2	122	ROR		6																	
64	BRA	REL	4	2	123	ASR		6																	
65	BRA	REL	4	2	124	ASL		6																	
66	BRA	REL	4	2	125	RSL		6																	
67	BRA	REL	4	2	126	DEC		6																	
68	BRA	REL	4	2	127	INC		6																	
69	BRA	REL	4	2	128	TEST		6																	
70	BRA	REL	4	2	129	CLR		6																	
71	BRA	REL	4	2	130	COM		6																	
72	BRA	REL	4	2	131	LSR		6																	
73	BRA	REL	4	2	132	ROR		6																	
74	BRA	REL	4	2	133	ASR		6																	
75	BRA	REL	4	2	134	ASL		6																	
76	BRA	REL	4	2	135	RSL		6																	
77	BRA	REL	4	2	136	DEC		6																	
78	BRA	REL	4	2	137	INC		6																	
79	BRA	REL	4	2	138	TEST		6																	
80	BRA	REL	4	2	139	CLR		6																	
81	BRA	REL	4	2	140	COM		6																	
82	BRA	REL	4	2	141	LSR		6																	
83	BRA	REL	4	2	142	ROR		6																	
84	BRA	REL	4	2	143	ASR		6																	
85	BRA	REL	4	2	144	ASL		6																	
86	BRA	REL	4	2	145	RSL		6																	
87	BRA	REL	4	2	146	DEC		6																	
88	BRA	REL	4	2	147	INC		6																	
89	BRA	REL	4	2	148	TEST		6																	
90	BRA	REL	4	2	149	CLR		6																	
91	BRA	REL	4	2	150	COM		6																	
92	BRA	REL	4	2	151	LSR		6																	